

IN THE CLAIMS:

1. (Previously Presented) A panel display apparatus for displaying an image in a discharge sustain period, comprising:

a gas discharge panel in which a plurality of discharge cells are arranged in the form of

matrix between a pair of substrates; and

a driving circuit which applies a write pulse to selected discharge cells of the plurality of

discharge cells to write the image, and successively applies a plurality of sustain

pulses which alternate in polarity to each of the plurality of discharge cells to

perform a sustain discharge in the selected discharge cells,

wherein a pulse waveform of each sustain pulse is determined so that a particular current

waveform is formed when the sustain pulse is applied, the particular current

waveform being a waveform in which a time from when a peak is reached to

when a fall is completed is no more than triple a time from when a rise is started

to when the peak is reached.
2. (Currently Amended) A panel display apparatus for displaying an image in a discharge sustain period, comprising:

a gas discharge panel in which a plurality of discharge cells are arranged in the form of

matrix between a pair of substrates; and

a driving circuit which applies a write pulse to selected discharge cells of the plurality of

discharge cells to write the image, and successively applies a plurality of sustain

pulses which alternate in polarity to each of the plurality of discharge cells to

perform a sustain discharge in the selected discharge cells,

wherein immediately before a leading edge of each sustain pulse which is applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse[,] to the discharge cell for a predetermined period that is no more than 100 ns.

3. (Original) The panel display apparatus of Claim 2, wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than an absolute value of a voltage of the sustain pulse.
4. (Cancelled)
5. (Original) The panel display apparatus of Claim 3, wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 50 ns.
6. (Original) The panel display apparatus of Claim 2, wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than 1.5 times an absolute value of a voltage of the sustain pulse.
7. (Original) A panel display apparatus for displaying an image in a discharge sustain period, comprising:
a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and
a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and (b) successively applies a plurality of

sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells, wherein immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.

8. (Original) The panel display apparatus of Claim 7, wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than an absolute value of a voltage of the sustain pulse.
9. (Original) The panel display apparatus of Claim 8, wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 100 ns.
10. (Original) The panel display apparatus of Claim 8, wherein a time during which the absolute value of the voltage of the pulse is no smaller than the absolute value of the voltage of the sustain pulse is no more than 50 ns.
11. (Original) The panel display apparatus of Claim 7, wherein an absolute value of a voltage of the pulse that is opposite in polarity to the sustain pulse is no smaller than 1.5 times an absolute value of a voltage of the sustain pulse.

12. (Currently Amended) A panel display apparatus comprising:
a gas discharge panel in which a plurality of pairs of first and second electrodes covered
with a dielectric are arranged between a pair of substrates; and
a driving circuit which accumulates a wall charge on the dielectric to write an image, and
successively applies a plurality of sustain pulses which alternate in polarity
between each pair of first and second electrodes to perform a sustain discharge in
areas where the wall charge has been accumulated,
wherein immediately before a leading edge of each sustain pulse which is applied
between the pair of first and second electrodes, the driving circuit applies a pulse
that is opposite in polarity to the sustain pulse, between the pair of first and
second electrodes for a predetermined period that is no more than 100 ns.
13. (Original) The panel display apparatus of Claim 12, wherein the driving circuit applies
the pulse of the opposite polarity and the sustain pulse between the pair of first and
second electrodes, by applying two rectangular pulses that are opposite in polarity,
respectively to the first electrode and the second electrode.
14. (Currently Amended) A panel display apparatus comprising:
a gas discharge panel in which a plurality of pairs of first and second electrodes covered
with a dielectric are arranged
between a pair of substrates; and
a driving circuit which (a) accumulates a wall charge on the dielectric to write an image,
and (b) successively applies a plurality of sustain pulses which alternate in

polarity, between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,
wherein immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period that is no more than 100 ns.

15. (Previously Presented) A panel display apparatus for displaying an image in a discharge sustain period, comprising:
a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and
a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,
wherein an absolute value of a voltage of each sustain pulse which is applied to the discharge cell is higher during a first period than a second period, the first period being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

16. (Original) The panel display apparatus of Claim 15,
wherein a highest absolute value of the voltage of the sustain pulse in the first period
exceeds an absolute value of a discharge firing voltage of the discharge cell, and
the absolute value of the voltage of the sustain pulse in the second period is below the
absolute value of the discharge firing voltage of the discharge cell.
17. (Original) The panel display apparatus of Claim 16, wherein a time during which the
absolute value of the voltage of the sustain pulse exceeds the absolute value of the
discharge firing voltage is no more than 100 ns.
18. (Currently Amended) The panel display apparatus of Claim 15, wherein immediately
after the trailing edge of the sustain pulse, the driving circuit applies a pulse that is
opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period
that is no more than 100 ns.
19. (Original) A panel display apparatus comprising:
a gas discharge panel in which a plurality of discharge cells are arranged between a pair
of substrates; and
a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality
of discharge cells to write an image, and (b) successively applies a plurality of
sustain pulses which alternate in polarity, to each of the plurality of discharge
cells to perform a sustain discharge in the selected discharge cells,
wherein an absolute value of a voltage of at least a sustain pulse of the plurality of sustain
pulses which is first applied to the discharge cell is higher during a first period
than a second period, the first period being a fixed period from a leading edge of

the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

20. (Original) The panel display apparatus of Claim 19, wherein a highest absolute value of the voltage of the sustain pulse in the first period exceeds an absolute value of a discharge firing voltage of the discharge cell, and the absolute value of the voltage of the sustain pulse in the second period is below the absolute value of the discharge firing voltage of the discharge cell.
21. (Original) The panel display apparatus of Claim 20, wherein a time during which the absolute value of the voltage of the sustain pulse exceeds the absolute value of the discharge firing voltage is no more than 100 ns.
22. (Original) The panel display apparatus of Claim 19, wherein immediately after the trailing edge of the sustain pulse, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period.
23. (Currently Amended) A panel display apparatus for displaying an image in a discharge sustain period, comprising:
a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates; and
a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and successively applies a plurality of sustain pulses which alternate in polarity to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein immediately after a trailing edge of each sustain pulse which is applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period that is no more than 100 ns.

24. (Cancelled)

25. (Currently Amended) A panel display apparatus comprising:

a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates; and

a driving circuit which (a) applies a write pulse to selected discharge cells of the plurality of discharge cells to write an image, and (b) successively applies a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein immediately after a trailing edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, to the discharge cell for a predetermined period that is no more than 100 ns.

26. (Cancelled)

27. (Previously Presented) A panel display apparatus comprising:
a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged between a pair of substrates; and
a driving circuit which accumulates a wall charge on the dielectric to write an image, and successively applies a plurality of sustain pulses which alternate in polarity between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,
wherein when applying each sustain pulse between the pair of first and second electrodes, the driving circuit applies a first voltage between the pair of first and second electrodes for a fixed period from a leading edge of the sustain pulse, and applies a second voltage between the pair of first and second electrodes for a period from a lapse of the fixed period to a trailing edge of the sustain pulse, the second voltage having a smaller absolute value than the first voltage.
28. (Original) The panel display apparatus of Claim 27, wherein the driving circuit applies the first and second voltages between the pair of first and second electrodes, by applying two pulses that are same or opposite in polarity and overlap in time, respectively to the first electrode and the second electrode.
29. (Currently Amended) A panel display apparatus comprising:
a gas discharge panel in which a plurality of pairs of first and second electrodes covered with a dielectric are arranged between a pair of substrates; and
a driving circuit which accumulates a wall charge on the dielectric to write an image, and successively applies a plurality of sustain pulses which alternate in polarity

applies at least one sustain pulse between each pair of first and second electrodes to perform a sustain discharge in areas where the wall charge has been accumulated,

wherein immediately after a trailing edge of each sustain pulse which is applied between the pair of first and second electrodes, the driving circuit applies a pulse that is opposite in polarity to the sustain pulse, between the pair of first and second electrodes for a predetermined period that is no more than 100 ns.

30. (Original) The panel display apparatus of Claim 29, wherein the driving circuit applies the sustain pulse and the pulse of the opposite polarity between the pair of first and second electrodes, by applying two pulses that are same in polarity and overlap in time, respectively to the first electrode and the second electrode.
31. (Currently Amended) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:
 - a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and
 - a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,wherein in the discharge sustaining step, immediately before a leading edge of each sustain pulse which is applied to the discharge cell, a pulse that is opposite in

polarity to the sustain pulse is applied to the discharge cell for a predetermined period that is not more than 100 ns.

32. (Original) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:
- a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and
 - a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,
- wherein in the discharge sustaining step, immediately before a leading edge of at least a sustain pulse of the plurality of sustain pulses which is first applied to the discharge cell, a pulse that is opposite in polarity to the sustain pulse is applied to the discharge cell for a predetermined period.
33. (Previously Presented) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:
- a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and
 - a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, an absolute value of a voltage of each sustain pulse which is applied to the discharge cell is higher during a first period than a second period, the first period being a fixed period from a leading edge of the sustain pulse, and the second period being a period from a lapse of the fixed period to a trailing edge of the sustain pulse.

34. (Currently Amended) A driving method for displaying an image in a discharge sustain period in a gas discharge panel in which a plurality of discharge cells are arranged between a pair of substrates, comprising:

a writing step for applying a write pulse to selected discharge cells of the plurality of discharge cells to write the image; and

a discharge sustaining step for successively applying a plurality of sustain pulses which alternate in polarity, to each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells,

wherein in the discharge sustaining step, immediately after a trailing edge of each sustain pulse which is applied to the discharge cell, a pulse that is opposite in polarity to the sustain pulse is applied to the discharge cell for a predetermined period that is not more than 100 ns.

35. (New) A panel display apparatus for displaying an image in a discharge sustain period, comprising a gas discharge panel in which a plurality of discharge cells are arranged in the form of matrix between a pair of substrates, the apparatus also comprising a driving circuit which applies a write pulse to selected discharge cells of the plurality of discharge cells to write the image, and which successively applies a plurality of sustain pulses to

each of the plurality of discharge cells to perform a sustain discharge in the selected discharge cells, wherein:

the initial part of a sustain pulse immediately following the write pulse comprises at least

a first amplitude change and a second amplitude change within a 100 ns period;

the period of the sustain pulse is substantially longer than 100 ns;

either the first or second amplitude change increases the absolute value of the sustain

pulse amplitude and the other amplitude change decreases the absolute value of

the sustain pulse amplitude; and

and at least one of the first and second amplitude changes is more than twice the other

amplitude change; and

the absolute value of the sustain pulse amplitude for a majority of the pulse period is

approximately equal to a sustain voltage wherein the sustain voltage is less than

or equal to both the first and second amplitude changes.

36. (New) The display apparatus of claim 35 wherein the sustain voltage is less than a discharge firing voltage of the discharge cells of the gas discharge panel.
37. (New) The display apparatus of claim 36 wherein the larger of the first and second amplitude changes is greater than or equal to the discharge firing voltage of the discharge cells of the gas discharge panel.
38. (New) The display apparatus of claim 37 wherein the smaller of the first and second amplitude changes is approximately equal to the difference between the larger of the first and second amplitude changes and the sustain voltage.